

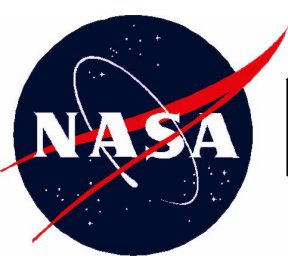
Safety, Health, and Environmental Division

# Kennedy Space Center Waste Diversion and Recycling Initiative



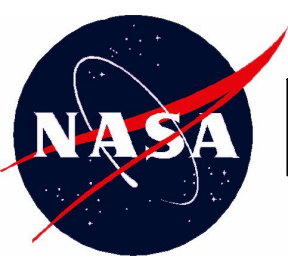
Frank Kline, P.E.

Comprehensive Health Services, Inc.



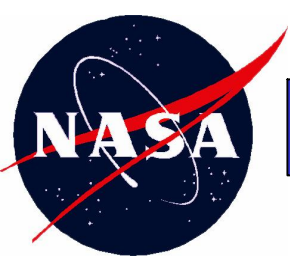
# Overview

- Why a solid waste diversion initiative.
- What makes KSC different.
- Phases completed
- Phases underway
- Phases planned
- Lessons learned



# WHY?

- **Driving Requirement:** EO 13101.
- **Agency Goal:** Meet annual 35% waste diversion.
- **Purpose:** Optimize KSC waste disposal capacity and reclaim readily recyclable materials from C&D waste streams.
- **Objective:** Evaluation of current waste disposal practices and determine optimum approach to maximize waste segregation and diversion.
- **KSC Goals:** Protect Environment, Exceed Agency goals, Extend landfill lifespan, Make diversion easy.

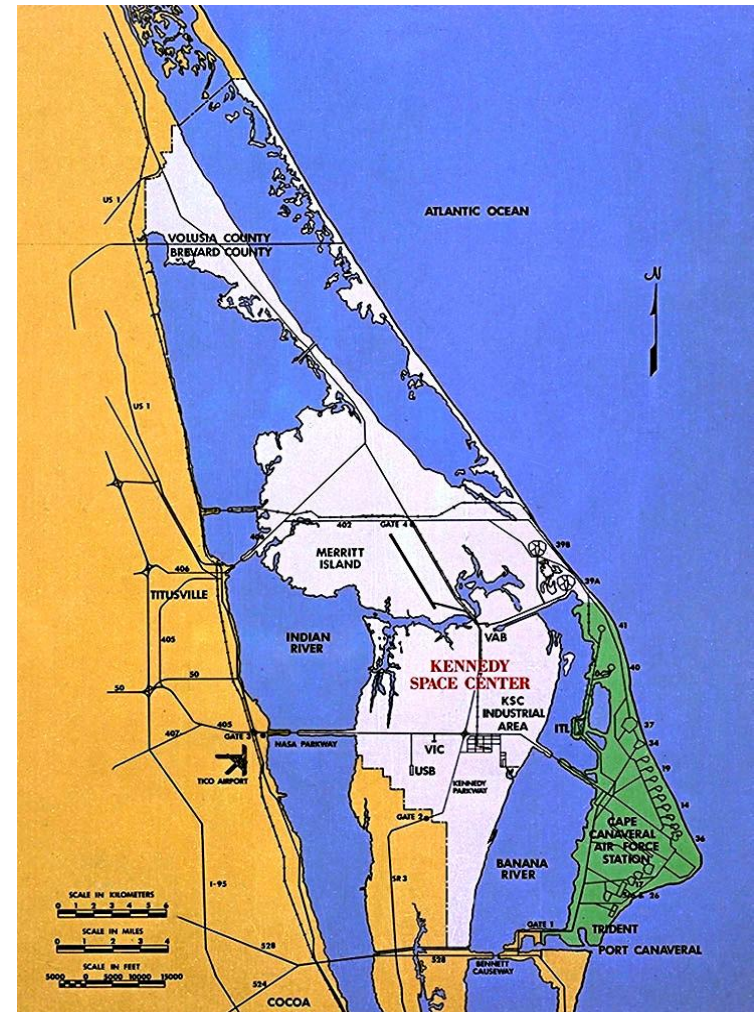


## Safety, Health, and Environmental Division

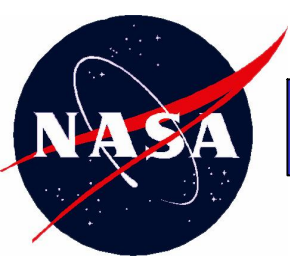
# Solid Waste Disposal for NASA Agency (1998 - 2002)

Center	Average (Tons)	% Agency Waste	35% Diversion Goal (Tons)
KSC	30,214	46	10,575
JSC	18,096	28	6,334
All Other	17,322	26	6,062
Agency	65,632	100	22,971



[illegible]

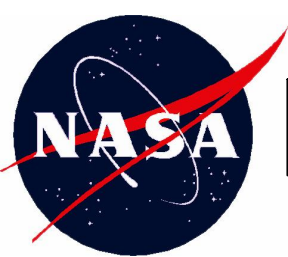




## Safety, Health, and Environmental Division

# The Mission

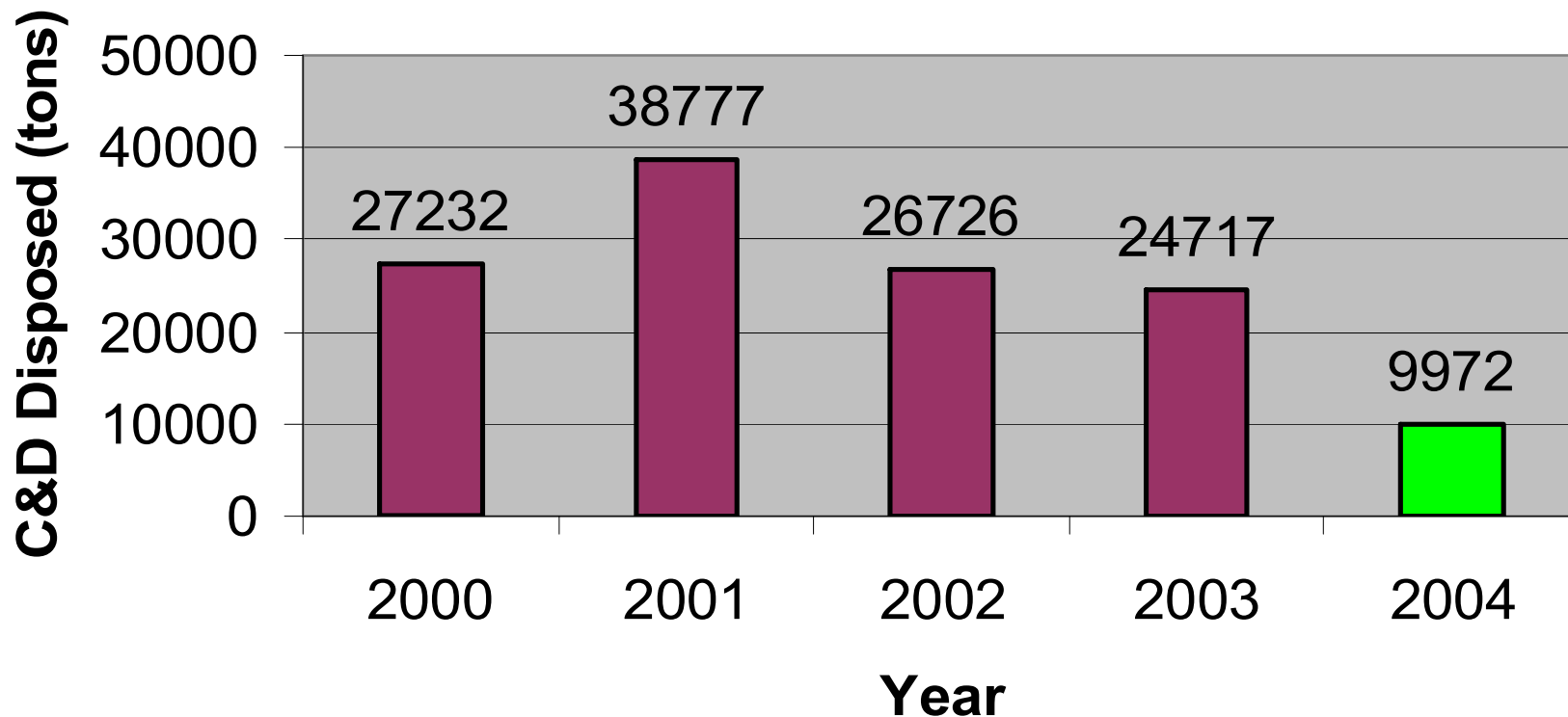


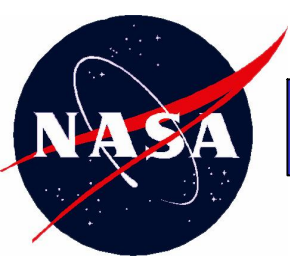


## Safety, Health, and Environmental Division

### Good Beginning – “The Numbers”

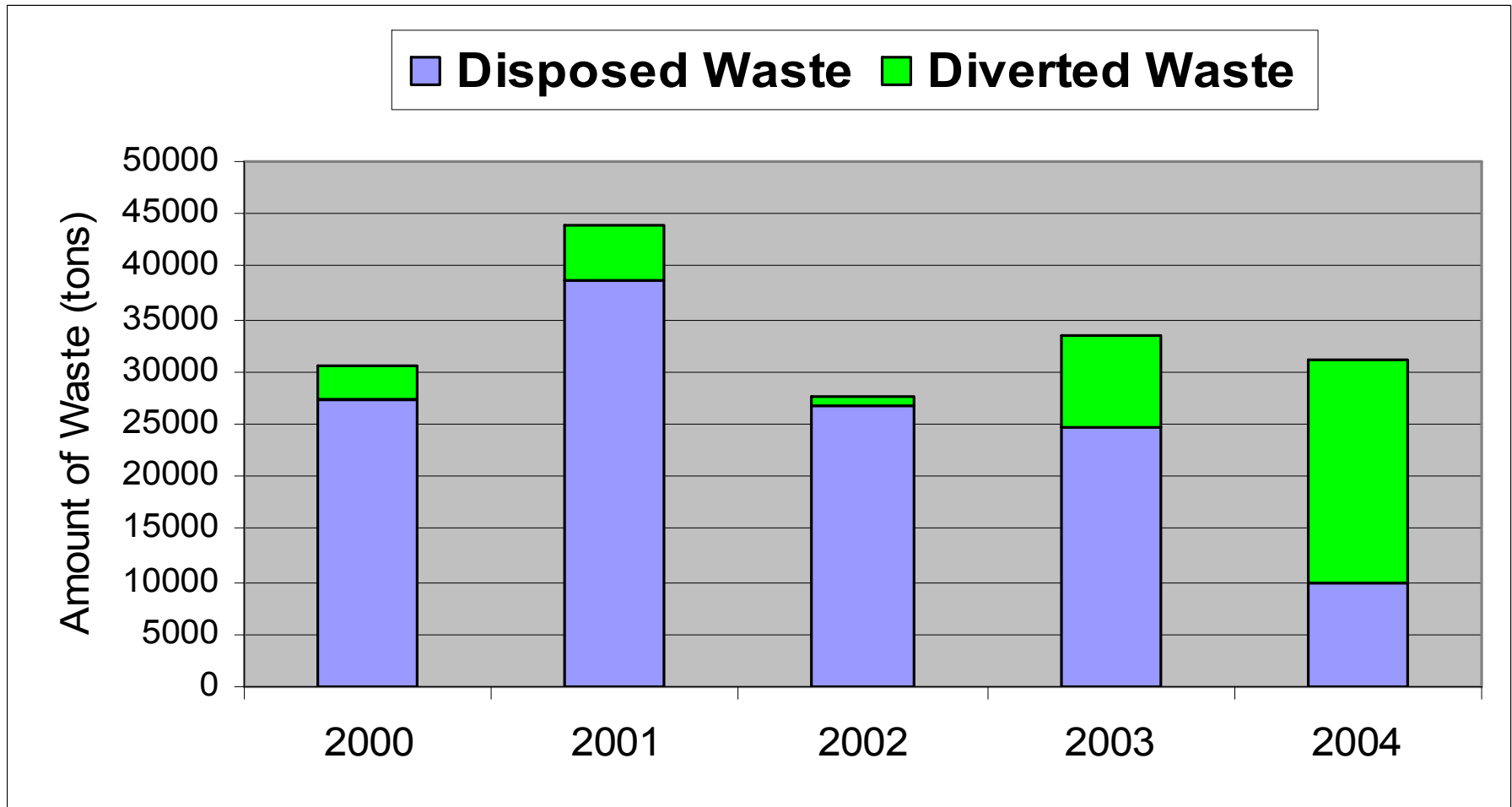
#### C&D Disposal Rates



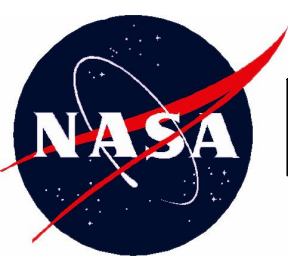


## Safety, Health, and Environmental Division

### “The Numbers”

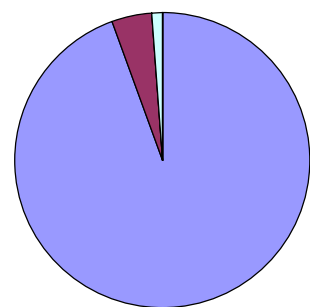




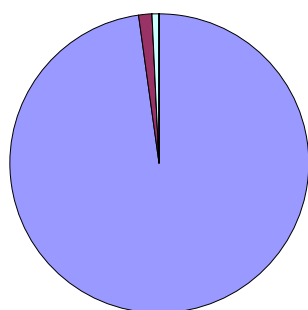


## Safety, Health, and Environmental Division

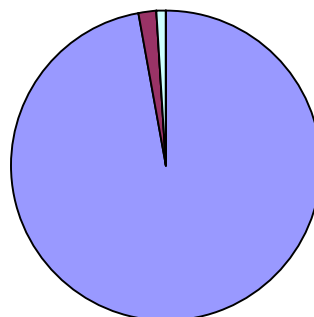
# Waste Composition (based on weight)



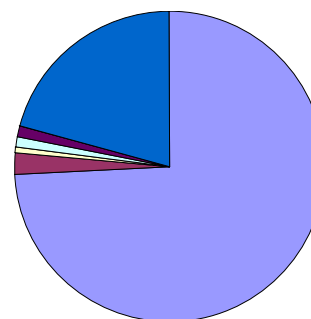
2000



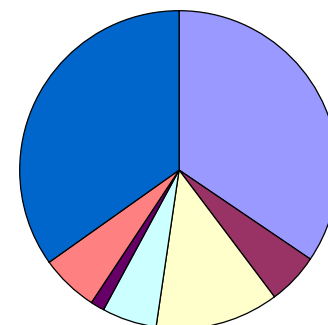
2001



2002



2003



2004



C&D Waste



Soil



Concrete / Cement



Wood



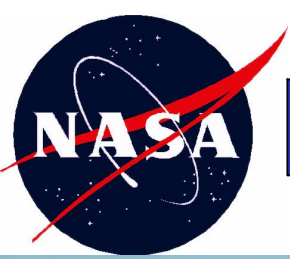
Asphalt



Blast Media



Yard Waste

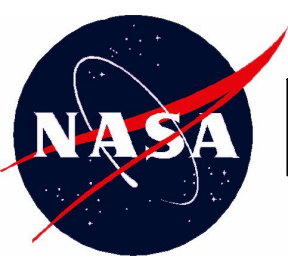


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# Phase I – Wood Pilot Project

- Illustrated Possibility of Waste Diversion / Reuse
- Successfully Diverted 150 tons of Wood / Vegetative Wastes



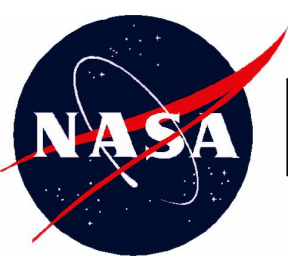


## Safety, Health, and Environmental Division

# Phase II - UCF Landfill Study

- Current disposal rates
- Composition
- Opportunities

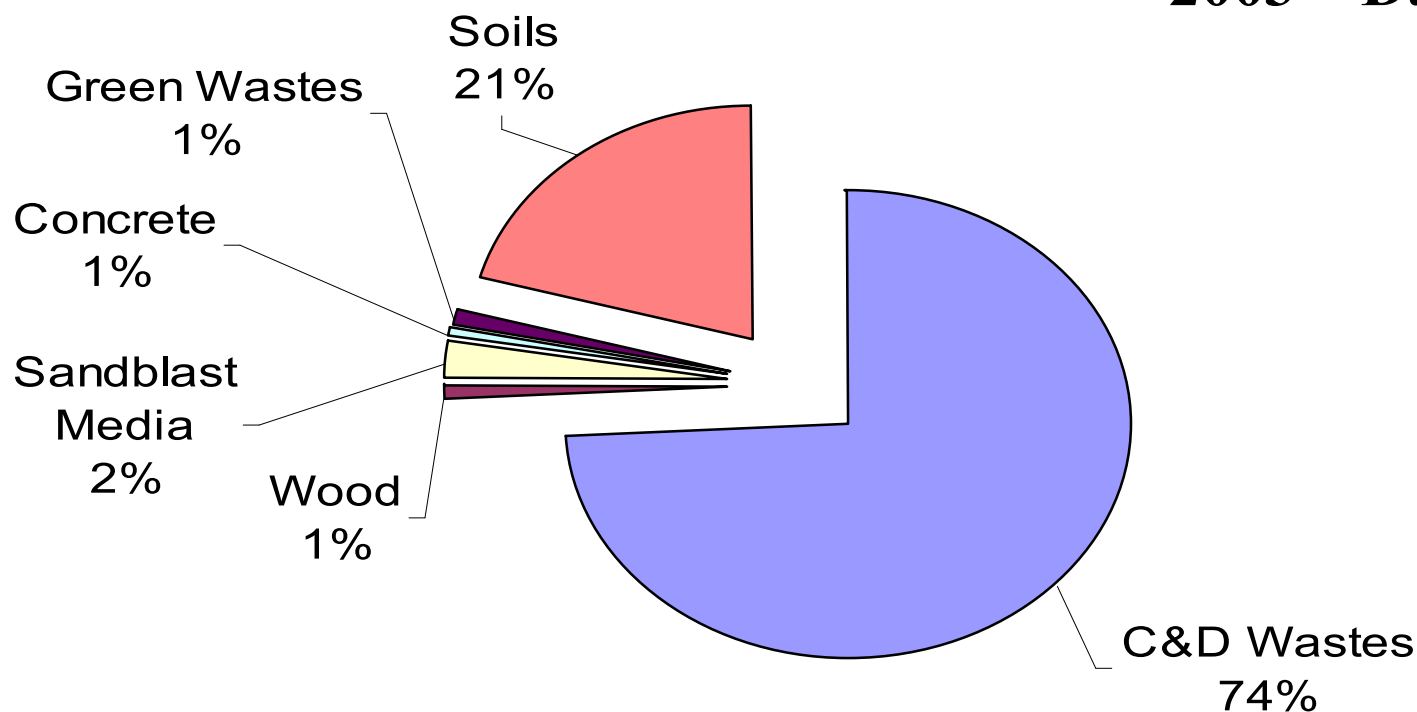




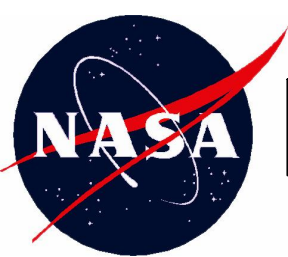
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# Waste Composition (based on weight)

**2003 – Data Only**



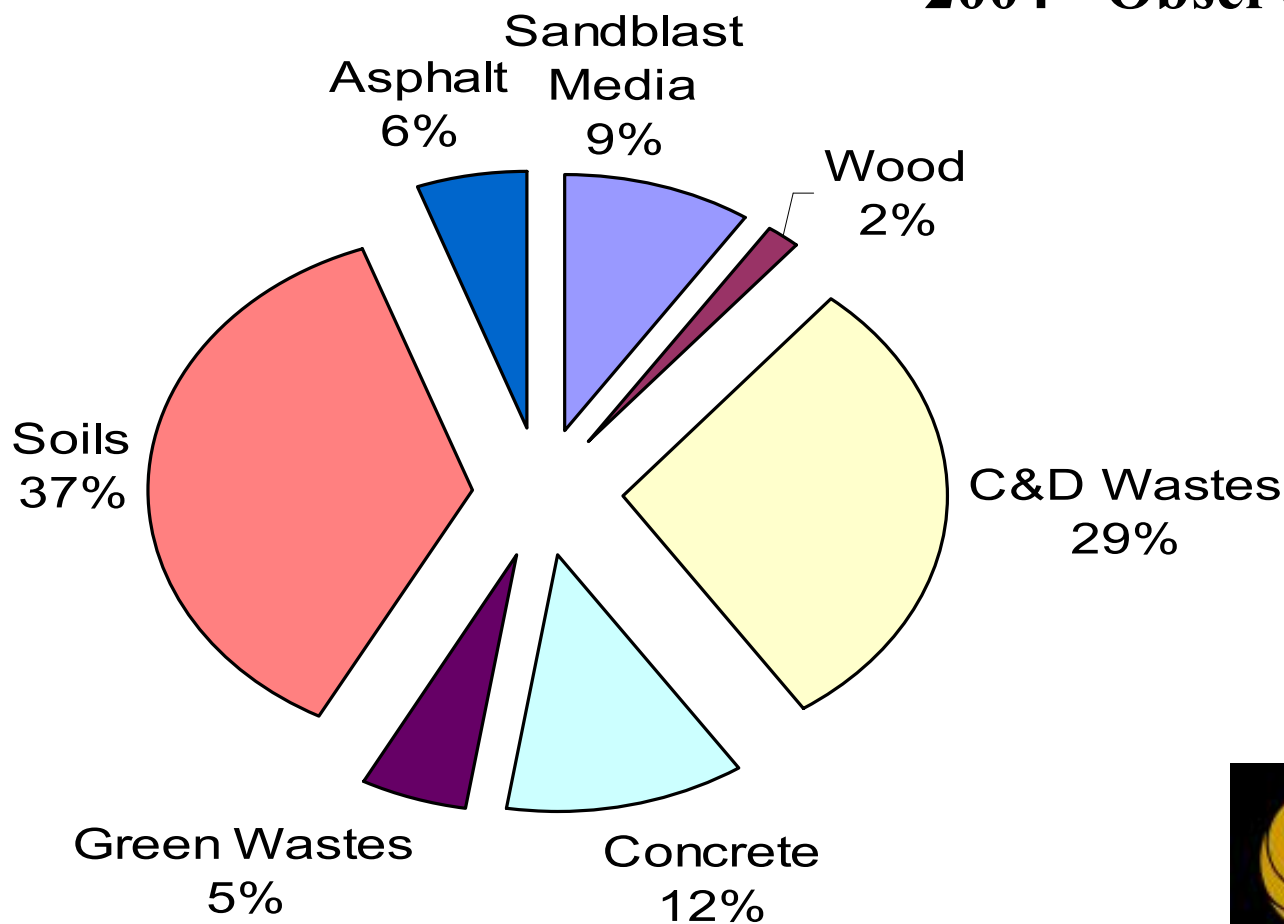


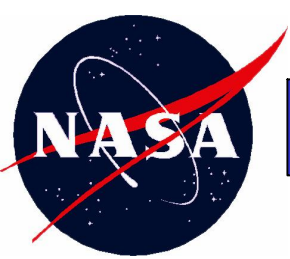


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# Waste Composition (based on weight)

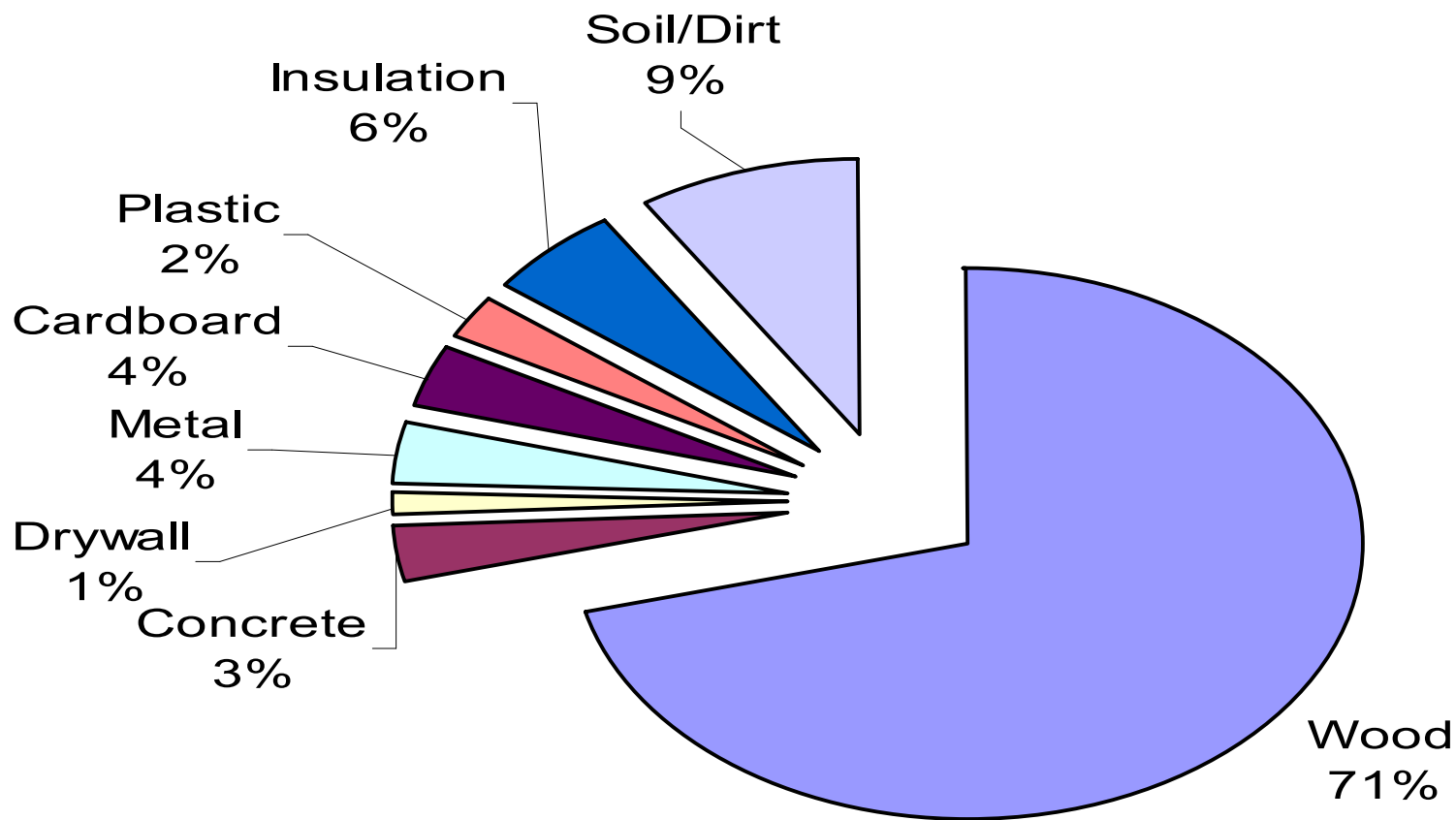
**2004 - Observation**

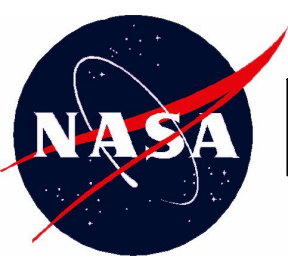




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### Volume Distribution of C&D Waste

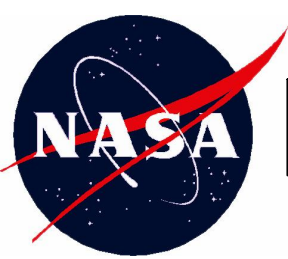




# Construction and Demolition Debris

## “Reduce, Reuse, Recycle & Rebuy”

1. Determine the Composition of KSC C&D
2. Determine Most Optimal Waste to Segregate
3. Develop Operating Procedures for Segregation
4. Stockpile / Record Diverted Material
5. Process Material
6. Re-Utilize / Sell

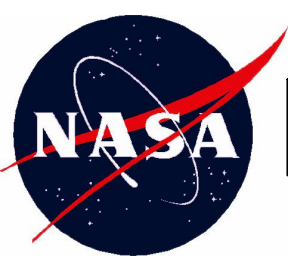


# Waste Diversion and Recycling Initiative Phase III – Process Changes

Require segregation at the source

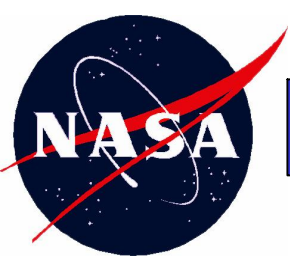
- Soil
- Blast Media
- Asphalt
- Concrete\*





# Development of KSC Diversion Area Site Requirements

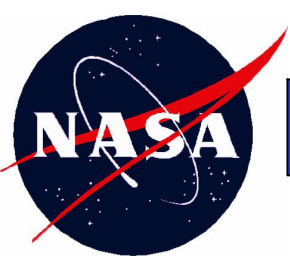
- Sized to handle current diversion
- Located close to Landfill Scale House
- Located close to Working Face of C&D Landfill
- Minimal Interference with Operating C&D Landfill
- Ability to Restrict / Control Access
- Available Immediately
- Minimal Cost to Initiate / Operate (No additional FTE)
- Expandability
- Limited Environmental Impacts



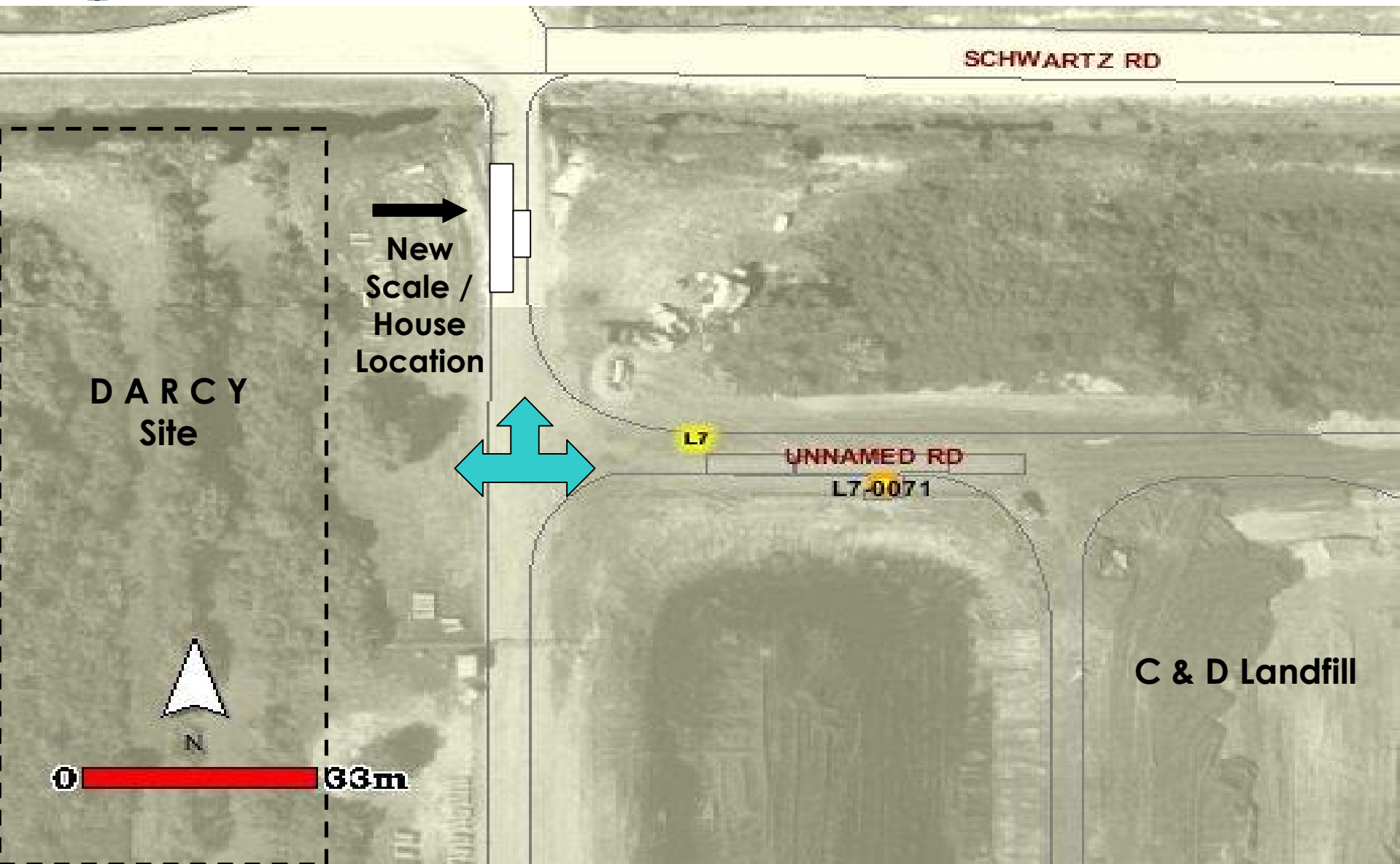
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# KSC Landfill / New Diverted Aggregate Reclamation and Collection Yard (DARCY)

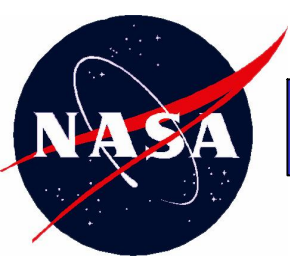




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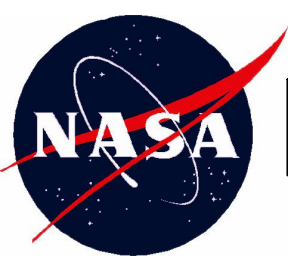


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# New Solar Powered Scale / Scale House







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# Scale House Improvements

## Recording Data

Old Method

RSC CLASS III LANDFILL  
DAILY WASTE RECORD LOG 912

DATE: 5-13-03 J. Shaw J. Chestee

Load	Truck Identification	Truck Gross Weight (lbs)	Truck Tare Weight (lbs)	Gross Weight (lbs)	Description of Waste	
1001	Suncoast Trk / Belmont	103240	20550	82790	Med Demo	20
1002	↓	54320	20200	34120	↓	21
1003	↓	101320	34020	67300	↓	22
1004	↓	108320	34240	74080	Asphalt	23
1005	↓	54820	30100	24720	↓	24
1006	↓	90240	33700	56540	↓	25
1007	↓	59040	21140	37900	Asphalt	26
1008	Yang Int Rd Crew	52800	24180	28620	Coke Dust (a)	27
1009	Yang Int Wood Trk	25500	24140	1360	Wood	28
1010	Suncoast Trk/Belmont	59440	27240	32200	Med Demo	29
1011	↓	76420	30620	45800	↓	30
1012	↓	55820	26100	29720	↓	31
1013	↓	60220	27300	32920	↓	32
1014	↓	104600	33440	71160	↓	33
1015	↓	104640	30640	74000	↓	34
1016	Yang Int - Wood Trk	25500	24300	1200	Wood	35
1017	V.A. Boring	18300	50440	32140	Asphalt (New)	36
1018	Suncoast Trk / Belmont	54480	27320	27160	Med Demo/Asphalt	37
1019	Yang Int Rd Crew	50400	23760	26640	Coke Dust (a)	38
1020	Suncoast Trk / Belmont	51500	28100	23400	Asphalt	39
1021	CMT, etc / Capt.	13560	10400	2760	Debris	40
1022	Yang Int - Rd Crew	28700	14300	14400	Coke Dust (a)	41
1023	Reduce / Reuse Things	100600	25440	75160	Dirt (P&B)	42
1024	Yang Int Rd Crew	57240	23400	33840	Coke Dust (a)	43
1025	Suncoast Trk / Belmont	70100	32000	38100	Asphalt	44
1026	V.A. Boring	141040	28000	113040	Asphalt (New)	45
1027	Suncoast Trk / Belmont	55500	27240	28260	Asphalt/Med Demo	46
1028	Yang Int Rd Crew	30300	14300	16000	Dirt	47
1029	Dynalene	57000	4880	52120	Wood/PVC	48
1030	Suncoast Trk / Belmont	55100	24600	30500	Asphalt/Med Demo	49
1031	Yang Int - Wood Trk	130000			Wood	50
1032	Suncoast Trk	58480			Asphalt/Med Demo	51
1033	Reduce / Reuse Things	100240			Dirt (P&B)	52
TOTAL						

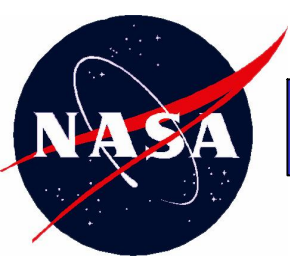
Pen and Paper

New Method

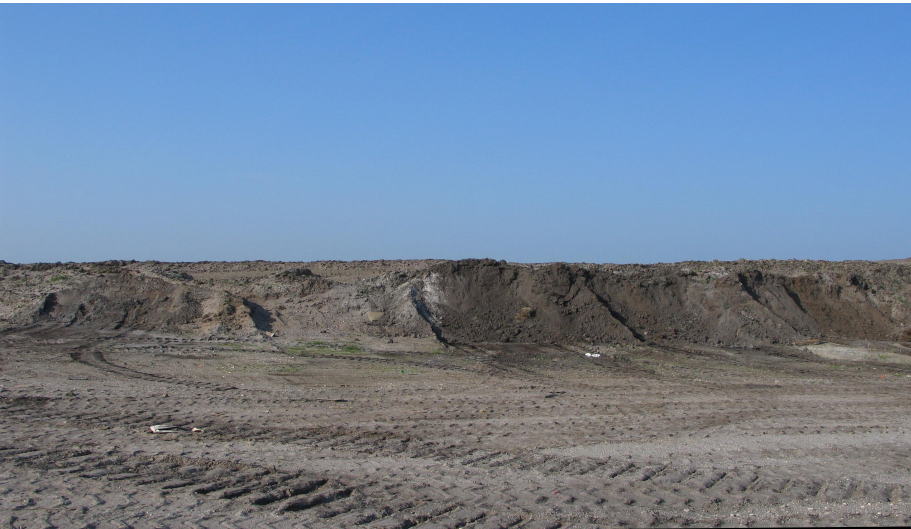


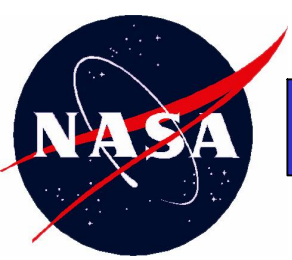
Custom Database





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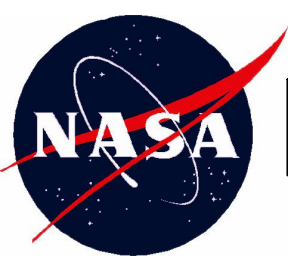




# Wrap-Up

- KSC Approaching 70% Diversion rate
- Wood / Vegetative Mulching Continuing
- Development of DARCY site / EA completed
- UCF Study – researching uses
- Scale House Upgrades
- Automated Recording
- New Equipment / Solar Power

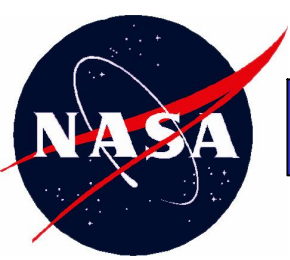




# Lesson Learned

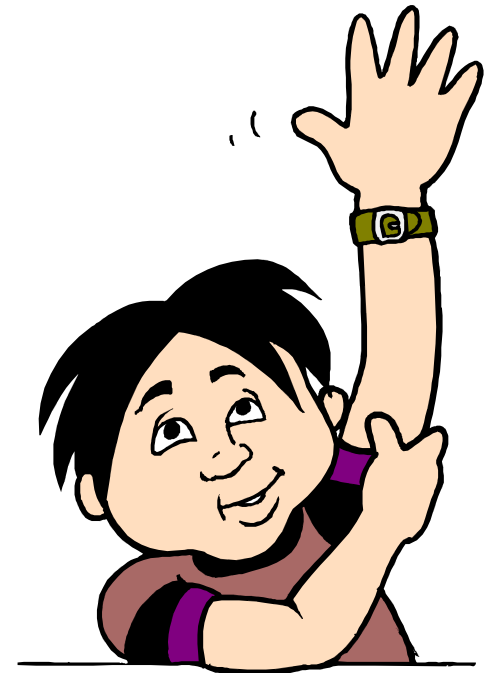
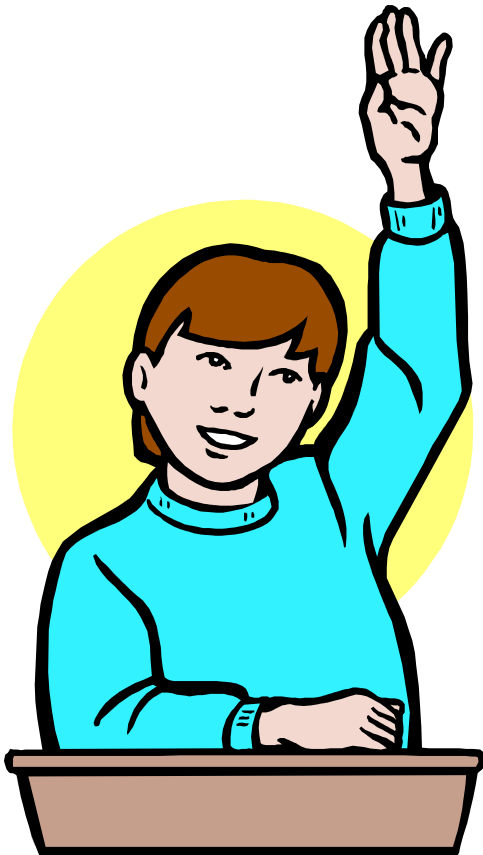
- Begin today
- Sell the idea – motivate employees
- Small steps
- Record progress
- Keep it simple

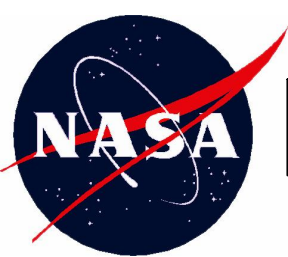




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## Questions





## Contacts

- John Ryan, NASA Environmental Management Systems, Kennedy Space Center, (321) 867-8413
- Frank Kline, Natural Resources & Special Projects, Comprehensive Health Services, Inc., Kennedy Space Center, (321) 867-8418